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TORNOS

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the first bar-turning
center*

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*SwissNano 7:
more parts
per square metre*

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*Bar milling
centres packed
with potential*

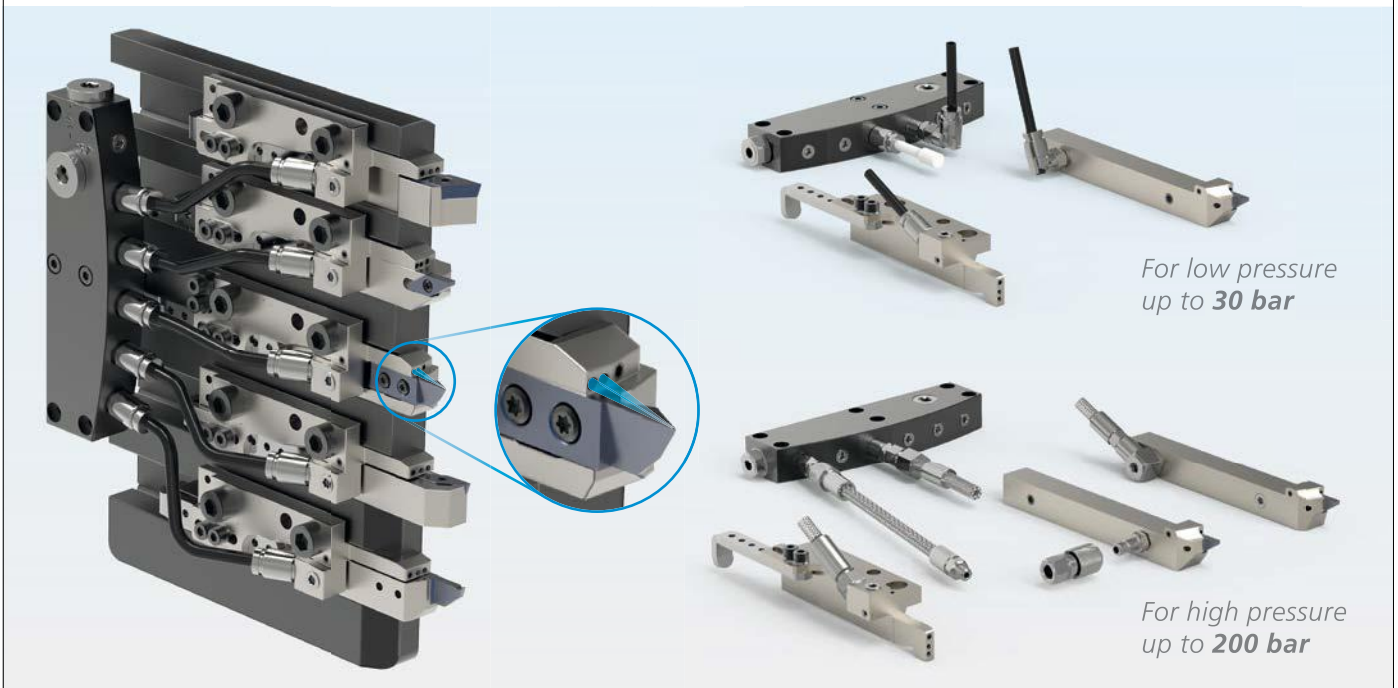
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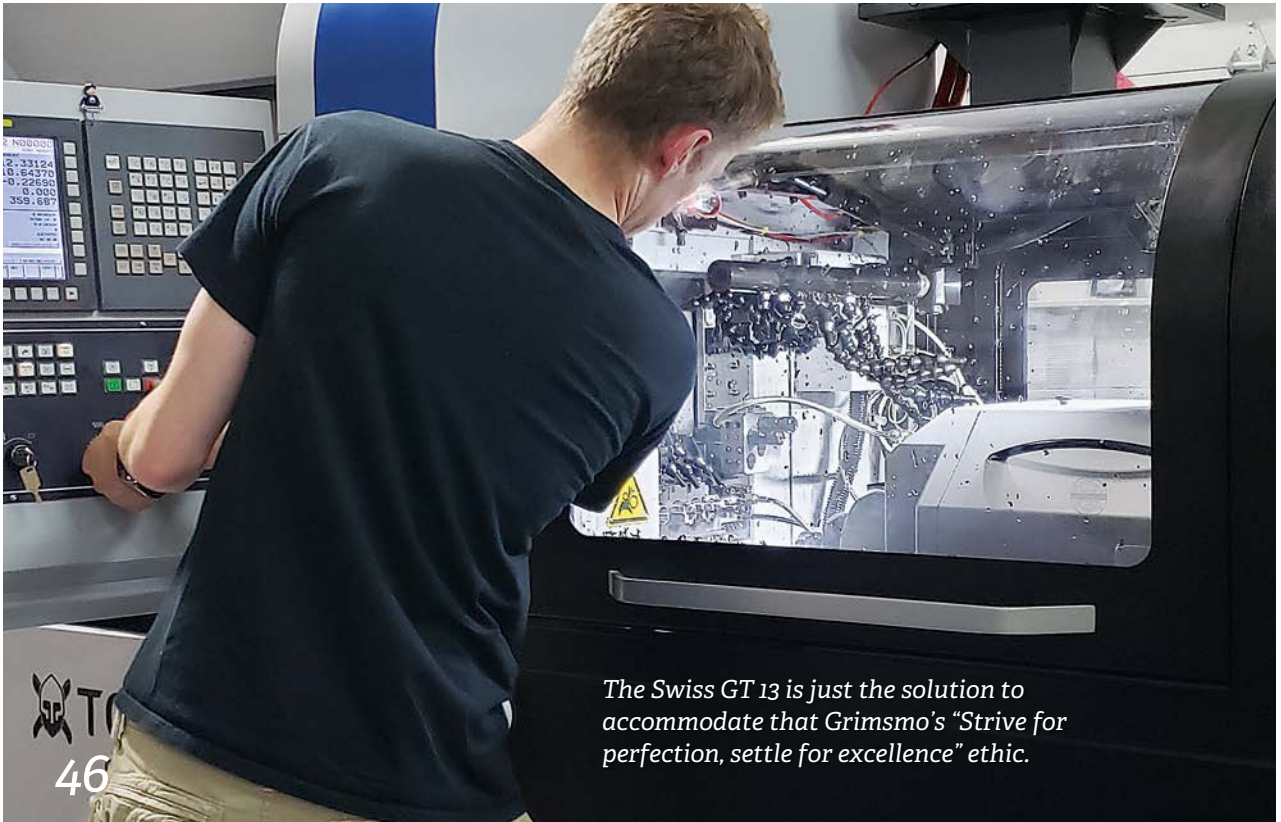
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The Swiss GT 13 is just the solution to accommodate that Grimsmo's "Strive for perfection, settle for excellence" ethic.

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"The German market is of crucial importance for the machine tool industry. Tornos is more than aware of this and continues to prove his commitment."

Michael Hauser CEO, Tornos

An interactive showcase of current trends

Michael Hauser **CEO, Tornos**

EMO Hanover 2019, taking place September 16–21 in Hanover, Germany, is a key event for our industry, the world of metalworking, and for Tornos—because it's a chance to meet the market and listen to its needs. With theme, "smart technologies driving tomorrow's production," EMO Hanover 2019 precisely addresses our efforts here at Tornos. In our company, we are not only developing the intelligent and interactive solutions our customers need, but anticipating our customers' future needs as well.

We are always listening to our customers and to their markets, monitoring current trends, and—with the agility that is part of our core values—constantly adapting, rethinking machine tools, and delivering increasingly personalized, customer-centric service. In this way, we open new perspectives for our customers and position them to seize opportunities in markets that are new to them.

Listening to the needs of our customers

For all these reasons and more, Tornos looks forward to EMO Hanover 2019. This event is the perfect opportunity to present our solutions and meet prospective and existing customers, who, over time, have literally become part of the Tornos network—the Tornos family. We have forged strong links not only in Germany but also in the rest of the world, and industry events like EMO Hanover 2019 shine a light on the essential threads that make us part of the international industrial fabric. At the same time, this trade fair's influence extends past national borders and into the global market that Tornos also proudly supports. We expect a large EMO 2019 audience, people close to

Tornos, but also all those interested in the world of machine tools. Such a show is indeed an opportunity to demonstrate our customer orientation and prove our promise: We keep you turning. This promise is backed by our renowned quality, our guarantee of precision, and more than 125 years of expertise that is at work on customer sites well beyond Switzerland. Our international influence is particularly strong in Germany.

Germany and machine tools

The German market is of crucial importance to the machine tool industry. Tornos is more than aware of this and continues to prove his great commitment to this critical market: We have just acquired land in Pforzheim where we will build our new German customer center by 2021.

In Germany, as in the rest of the world, our employees are trained in the latest technologies: They know their subject matter inside out. We have employees in our team who have been loyal to Tornos for more than three decades. Over the years, they have developed a special relationship with our customers, who know that they are at the right place when they contact Tornos.

This is what I mean when I talk about "the Tornos family." For Tornos, customers are not just owners of our products; they are full members of our team. We integrate them into certain phases of the design and development of our machines to ensure that our solutions perfectly meet their expectations.

Nothing is impossible

It is not uncommon for a customer, faced with the intrinsic complexity of a part to be produced, turns to one of our employees for help. We do not produce parts, but we know how to make them, and this expertise is a benefit that lasts well beyond the acquisition of a machine—because we support our customers throughout the complete life cycles of their Tornos machines. Our Tornos Academy courses allow our customers realize the full potential of their Tornos machines, and our trainers are guide each customer along the path to application and process mastery.

An astonishing range of possibilities

Our EMO Hanover 2019 presence in Hall17 stand 15 is the place to discover the Tornos difference. We are exhibiting no less than 10 machines on 450 square meters, and we are presenting the entire range of Tornos products, as well as our TISIS programming software and Tornos Service, which offers tailor-made services all over the world, whether through the intervention of our Field Service engineers or by our fast provision of spare parts.

A jewel of precision and ergonomics

A real standout in our all-star EMO Hanover 2019 lineup is our brand new SwissNano 7, the “big sister” of our SwissNano 4, the master of small parts requiring very high precision. The SwissNano 7’s kinematics allow it to produce most of the turned parts of a watch movement, for example, from simple parts to more complex. This solution already excels in the Medical & Dental segment, where users praise its unique concept and design and its mastery of very small diameters.

The SwissNano 7 will be center stage at EMO Hanover 2019, but it won’t be alone. We look forward to showing you all of the stars in our lineup—and even more innovation, precision and productivity—at EMO Hanover 2019, a unique opportunity for you to “Turn to Tornos.”

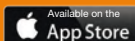


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EMO HANOVER 2019

Competitiveness and adaptability

Tornos invites the manufacturing world to EMO Hanover 2019, September 16–21, in Hanover, Germany. At its usual location, stand D15 in Hall 17, the Moutier, Switzerland-based machine tool manufacturer will present its range of innovative, intelligent solutions, resolutely focused on the requirements of a constantly evolving market. Tornos awaits your visit to its impressive 450-square-meter stand!

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Special focus on industry 4.0

Smart technologies driving tomorrow's production: This is the promising theme of EMO Hanover 2019, which is undoubtedly the largest metalworking exhibition of the year, since manufacturers from all over the world are expected to attend. As a metal-working center of competence at the highest level, EMO Hanover is must for both for manufacturers and their suppliers.

A showcase of Tornos know-how

Beyond machines, Tornos offers production workflow solutions, including its integrated Industry 4.0-enabling TISIS software, which allows programming and communicating directly with the machine. The user is guided intuitively to ensure optimal use of all available tools.

On Tornos' stand, expert engineers and R&D team members will demonstrate the infinite range of possibilities offered by the intelligent software that they are constantly developing with their teams to offer customers ever more innovative solutions for connected production.

Accuracy, performance, productivity and ergonomics

The TISIS software is designed to work with the entire Tornos machine park, including Tornos' EMO Hanover 2019 all-star SwissNano 7, the latest addition to the SwissNano range. Reliable, precise and ergonomic, the SwissNano makes it possible to meet the most demanding machining challenges. Extremely flexible, it is the ideal partner for machining small components requiring very high precision. It offers almost unlimited possibilities, whether for thread whirling, gear hobbing or the use of a high-frequency spindle. Originally designed to produce practically all the parts of a watch movement, SwissNano has proved to be an essential partner to the Medical & Dental world, as well as the universe of connectivity, which have benefited from

the start from its exceptionally flexible machining area. Compact and efficient, the machine is also extremely easy to set up. The most unique element are its kinematics and the counter-spindle which is based on three numerical axes. This makes counter-spindle operations much easier.

Solutions that fill an important niche

In direct response to customers' demand for a compact, all-in-one chucker solution to increase their flexibility and the economic feasibility of working with blanks, Tornos is debuting its all-new and impressively compact MultiSwiss 6x32 Chucker lathe at EMO Hanover 2019. The goal of this concept is to have allow execution of special shapes and finishing of parts with precise turning and limited roughing operations.

A demonstration of unfailing flexibility

The SwissNano 7 will be center stage and in action on the Tornos stand, along with other Tornos solutions such as the SwissDeco 36 TB, a true standout due to its most advanced performance. All equipped with



three independent tool systems, SwissDeco machines are designed to provide their users with exceptional flexibility while maintaining extraordinary ease of use. The SwissDeco range combines more than 125 years of experience in a single machine. It is much more than a range of machines: It is a true vision of the future of bar turning.

A glimpse of the past and the future

A true "time capsule," the Deco 13 is a machine that has been widely praised by appreciative Tornos' customers. Most of who acquired a Deco 13 at the time still use it. That is why Tornos Service is presenting a completely renovated Deco 13 at EMO Hanover 2019. Past and future are therefore closely intertwined in the Tornos universe, balancing know-how more than a century old with artificial intelligence hyper connected, intuitive and generational.

Perfect fluid and chip management

All Tornos machines are true machining centers. Milling is no exception to this rule and has been included in Tornos' catalog of services for several

years. The BA 1008, with ergonomics based on the SwissNano platform, is a compact production tool for small, precise prismatic parts. Its parallel clamping system makes it a must when it comes to milling.

We keep you turning

True to its now well-known promise, "We keep you turning," Tornos' EMO Hanover 2019 presence is more than just a showcase: it is a nexus of connectivity and interactivity. Discover it all, September 16–21: It's time to Turn to Tornos!

[tornos.com](https://www.tornos.com)

Tornos teams from around the world came together at EMO to offer visitors an unrivalled experience.





Intelligently bridging bar-type machining centres and bar turning machines, the SwissDeco TB is one of the centrepieces on the Tornos stand at EMO 2019 (hall 17, stand D15).

SWISSDECO 36 TB:

the first bar-turning center

EMO Hanover 2019 guests will discover Tornos' smart new SwissDeco 36 TB.

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Smart technologies driving tomorrow's production are at the heart of EMO Hanover 2019, set for September 16–21 in Hanover, Germany, and sure to turn heads at the premier metalworking exhibition is Tornos' new SwissDeco 36 TB. Intelligently bridging bar-type turning centers and bar turning machines, the SwissDeco 36 TB is the centerpiece of Tornos' EMO Hanover 2019 exhibition space (hall 17, stand D15).

At EMO, visitors will see how the SwissDeco 36 TB makes easy work of machining at 250 mm long intramedullary (IM) nail with internal threads. Used in orthopedic trauma to ensure bone fixation, IM nails call upon Tornos' extensive deep hole drilling expertise—and the SwissDeco 36 TB, with the essential B axis and Z2 axis and handy fluid module situated right next to the machine, flawlessly executes deep hole drilling. Machine autonomy is supported by its ingenious high-end cutting fluid management and

available configuration with up to two-high-pressure pumps. Equipped as standard with a heat exchanger, this solution can be connected to a cold-water network or a water chiller.

The application to be shown at EMO showcases Tornos' mastery of the thread whirling process on a sliding headstock lathe, making it possible to produce nails with perfect internal threads, good surface finish and high dimensional accuracy. Tornos' thread whirling process significantly increases productivity, eliminates bending and vibration, and resolves the challenges of producing both IM nails and self-locking screws.

Outstanding performance

Based on the structure that is the hallmark of the entire SwissDeco range, the SwissDeco 36 TB has a high-power spindle and an ultra-rigid cast machine base equipped with extra-large guiding elements, allowing the user to leverage the full potential of the machine. In combination, these characteristics mean

that the machine can withstand high loads even when machining the toughest materials.

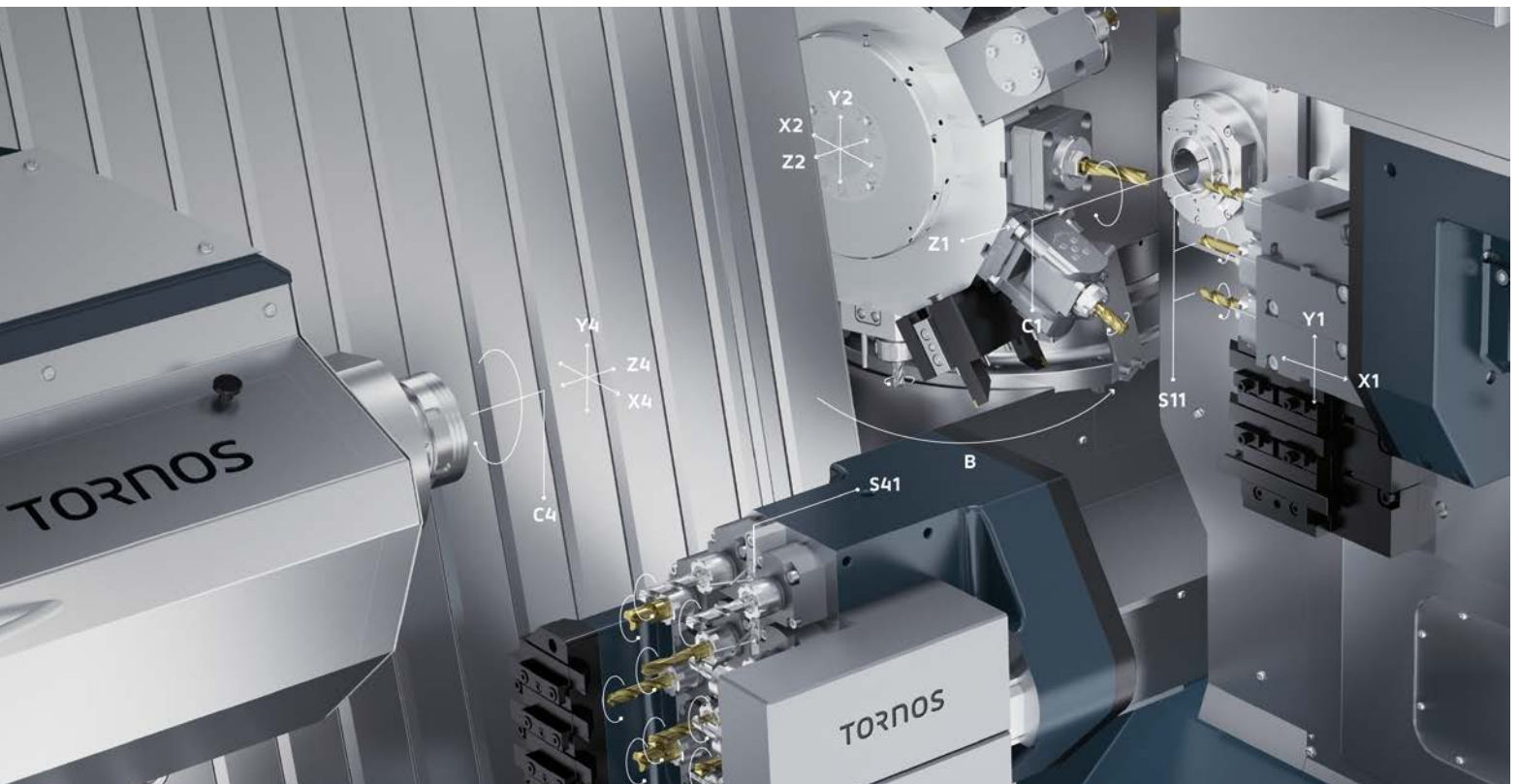
"With SwissDeco, we set out to design an uncompromising machine—and our EMO visitors will discover that we succeeded," explains Philippe Charles, Head of Swiss-type Product Management at Tornos.

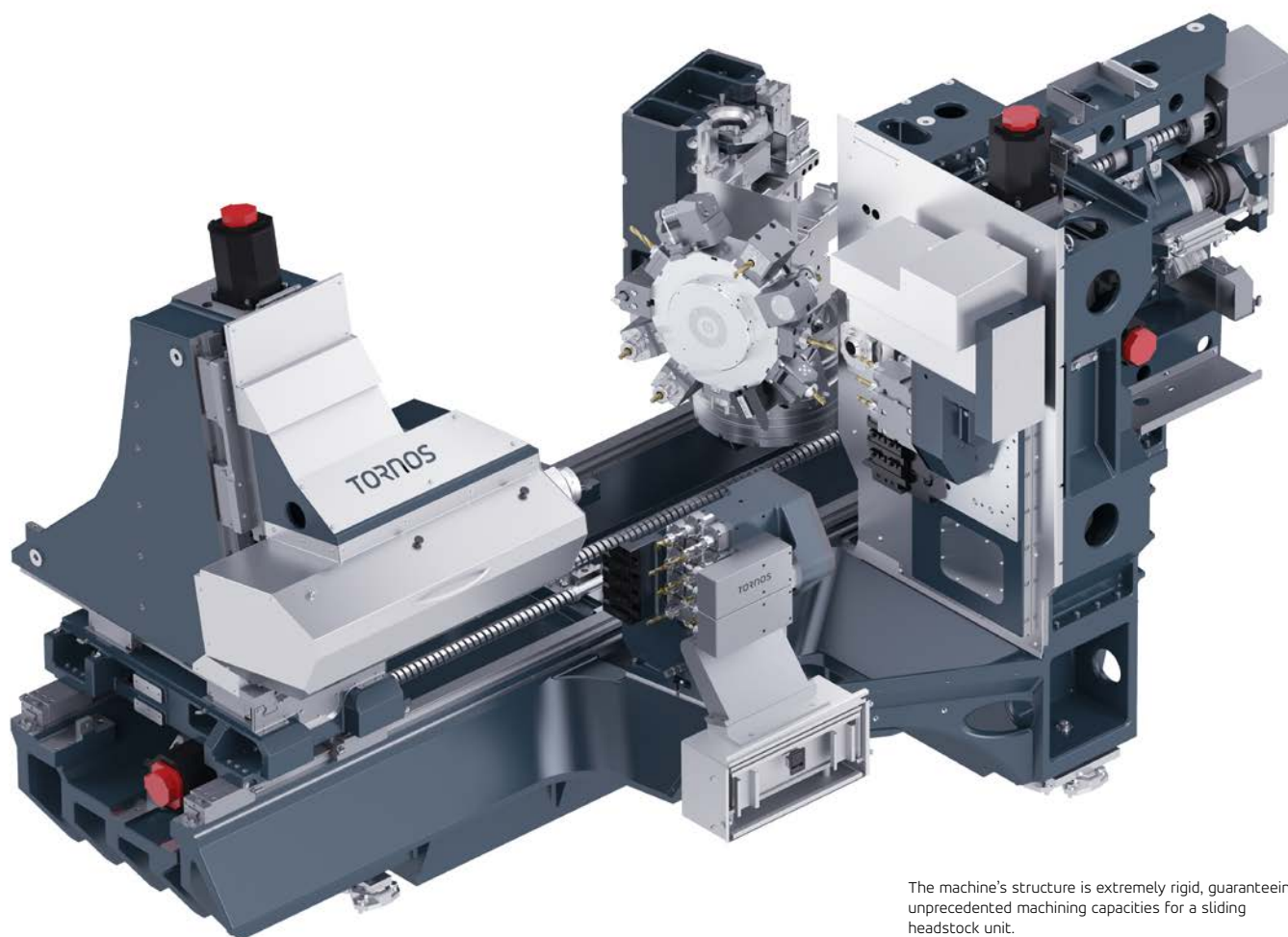
Comprehensive equipment

The SwissDeco 36 TB can be equipped with 57 tools including 36 driven tools.

"Today, a Swiss GT-type machine is also impressively equipped with a B axis and a number of tools, even if it has fewer tools than the SwissDeco. But the SwissDeco opens up a new era," Charles explains. The first noteworthy difference—besides the extremely rigid machine structure—probably is the SwissDeco 36 TB's 36 mm machining diameter. If the user opts for the 36 mm spindle, the solution's 53 Nm torque of is simply titanic; even the 25.4 mm diameter spindles 27 Nm torque.

The SwissDeco 36 TB features a 12-position turret mounted on a B axis. It is driven by a torque motor, and can pivot $\pm 130^\circ$.





The machine's structure is extremely rigid, guaranteeing unprecedented machining capacities for a sliding headstock unit.

"The machining capabilities of the SwissDeco 36 TB are really impressive—to such an extent that we can turn parts based on the parameters of the machining with a fixed headstock even if the machine is operated close to its limits," Charles adds.

Furthermore, Tornos builds ease of use into its solutions, he says.

"Since we want our customers to easily achieve application success, we provided our machine with long axis travels and the market's most powerful and rapid driven tools," Charles asserts. "Our SwissDeco 36 TB both manufactures the workpieces at hand but ensures perfect management. We offer various solutions for workpiece ejection, whatever the part's dimensions."

Furthermore, the machine is easy to use and setup, even during machining of complex workpieces, and it simplifies tool changes because its the turret can

approach the machine door so that the operator can change tools without having to bend into the machine.

12-position turret with B axis

Like the SwissDeco T, the SwissDeco 36 TB has a 12-position turret; it is mounted on a B axis, driven by a torque motor, and can be swiveled by $\pm 130^\circ$ and used both for main and back machining operations. That means the full diversity of turret tools can be utilized to perfectly execute applications requiring angular machining. Furthermore, the turret can be operated by means of the TISIS CAM software; this computer-aided design/computer-aided manufacturing (CAD/CAM) solution enables multi-point programming for workpieces. TISIS supports almost every CAD/CAM program on the market, putting manufacturers on the road to headache-free programming.

Efficiency: quick-change system

Optionally, the turret as well as other tooling systems can be complemented by a quick-change system that is compatible with the presetting devices, enabling setup to take place outside of the machine. The system can be used both for stationary and driven tools to ensure maximum flexibility. It permits ultrafast setup changes, which is another big plus, considering the SwissDeco's vast array of tooling options. Any changes become effective within a few seconds and the design guarantees superb concentricity and repeatability. The fact that the tool head can be unlocked by turning a single screw is another value-adding efficiency booster.

Efficiency: hydraulic brake

The SwissDeco is the first Swiss-type lathe featuring a high-precision hydraulic brake, guaranteeing high machining quality in any situation. The brake is actuated by material deformation and enables the bar to be precisely locked in the correct position, so spindle bearings and spindle body are relieved in case of four- and five-axis machining. Surface finish is considerably improved because the bar is maintained in the correct position, allowing the SwissDeco 36 TB to tackle tasks previously unachievable on conventional lathes or bar turning lathes.

Efficiency: TISIS Optimove

With the SwissDeco launch, the latest innovative TISIS version is now available. TISIS has evolved from a programming tool to become a true means of control for SwissDeco machines. From now on, the machine can very precisely precalculate the real machining time.

"Our customers can now realize machining jobs requiring extreme precision as well as production scheduling in a most meticulous manner," Charles declares. TISIS Optimove offers a multitude of additional advantages, the most important of which is the reduction of machining times. Just like TB-Deco, TISIS Optimove calculates the ideal tool path and the ideal feed rate for each tool. One might assume this would make for a rather slow machine, but the numbers speak for themselves: Thanks to its three tool systems, the SwissDeco 36 TB's productivity is

simply excellent. In certain cases, TISIS Optimove allows times savings of almost 25 percent. Combined with an 11 percent reduction in energy consumption, it provides significant added value, without operator intervention.

Another benefit is the reduced mechanical wear afforded by optimized axis travels eliminating unnecessary acceleration, so the mechanical system is protected while vibration and interference are avoided during the machining process.

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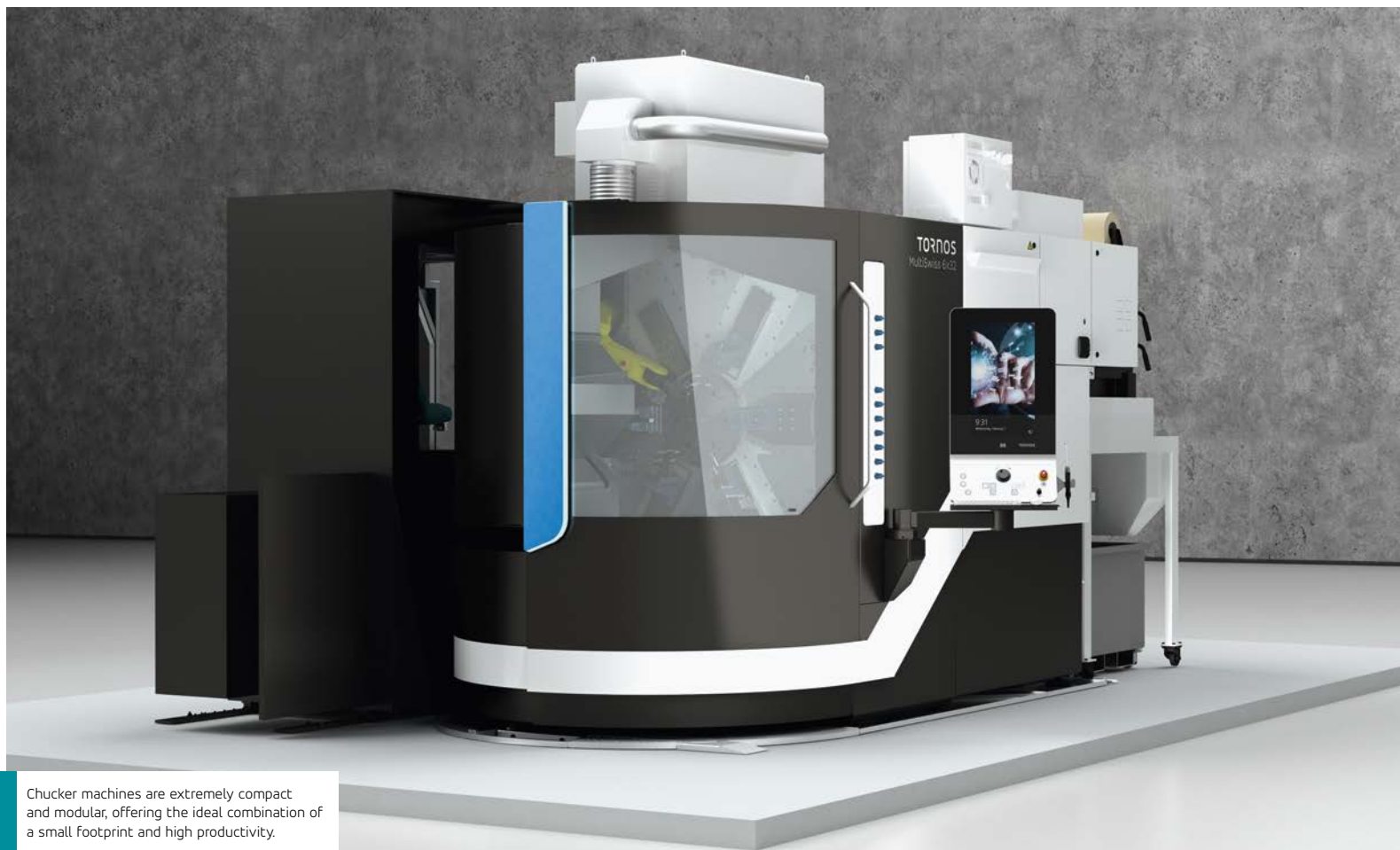
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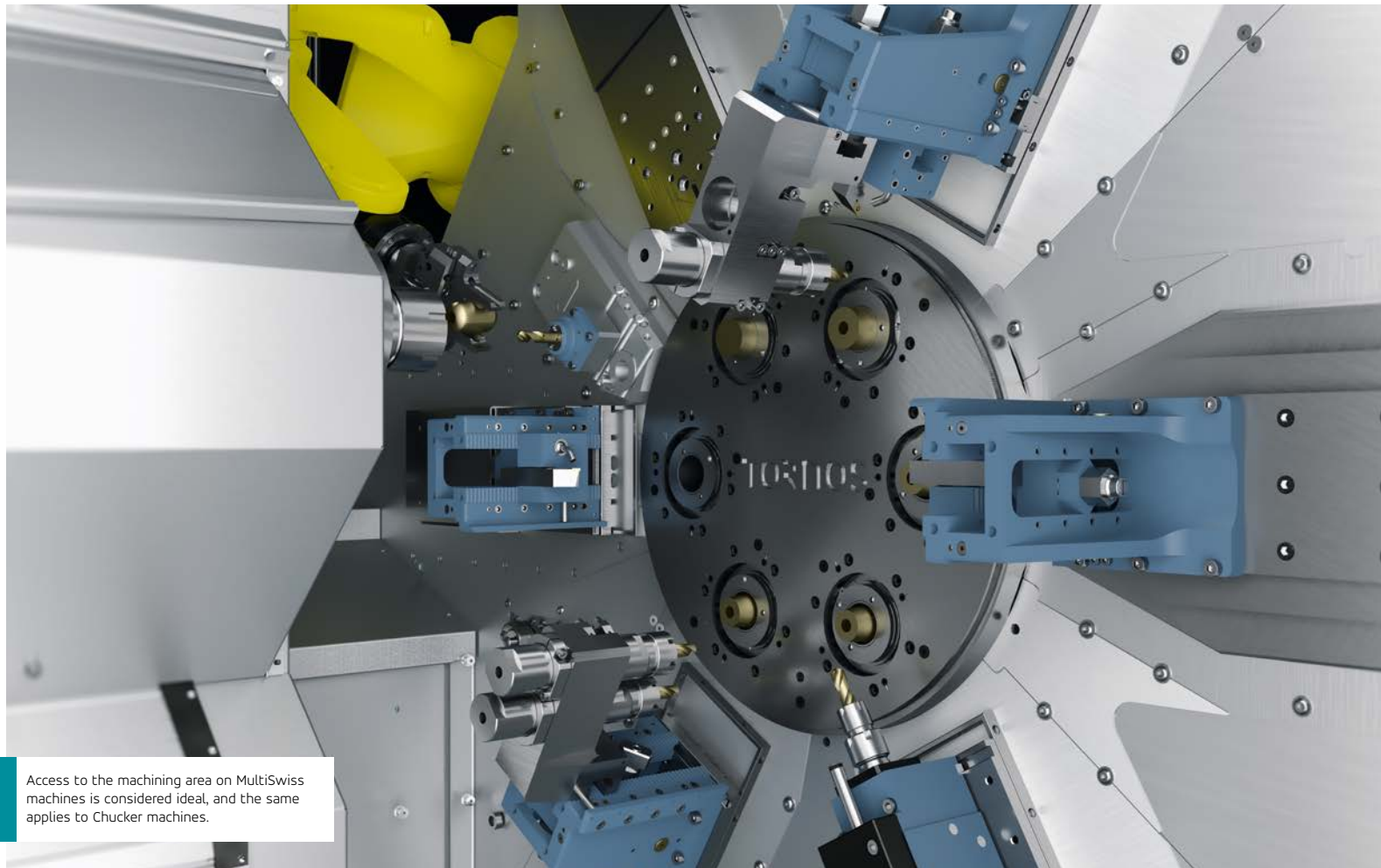


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Chucker machines are extremely compact and modular, offering the ideal combination of a small footprint and high productivity.



Access to the machining area on MultiSwiss machines is considered ideal, and the same applies to Chucker machines.

New MultiSwiss chucker solutions

fill an important niche

In direct response to customers' demand for a compact, all-in-one chucker solution to increase their flexibility and the economic feasibility of working with billets, Tornos' is debuting its all-new and impressively compact MultiSwiss 6x32 Chucker lathe at EMO Hanover 2019. This solution, along with the new MultiSwiss 6x16 Chucker, are the latest additions to the renowned MultiSwiss range.

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These two new chucker machines advance the Moutier, Switzerland-based lathe pioneer's technical legacy even further, since Tornos for years has built custom chucker solutions to meet customers' specific demands.

The economic advantages of using a chucker lathe to machine parts from blanks with specific cast, forged or metal injection molded (MIM) shape are well established. The goal of this concept is to have special shape and finish the part with precise turning and limited roughing operations.

The MultiSwiss 6x16 Chucker is the standard Tornos chucker solution. Parts can be loaded using a vacuum: the part is blown into the machining area in a device that turns it 90 degrees in front of position five; then, thanks to the numerical axis, the spindle picks up the part and machining starts in a clockwise direction (positions five, four, three, two

and one) and the part is extracted by the counter spindle. A vibrating bowl with a selector has been adapted and the part is blown to the outside of the machine. The machine can be reconverted to a bar turning machine by simply removing the simple internal turning system; this approach works well for parts that do not require angular positioning and have dimensions up to 15 mm.

The new MultiSwiss 6x32 Chucker is capable of machining parts from 5 mm to 40 mm in diameter—but its uniqueness doesn't end there. Based on Tornos' successful MultiSwiss 6x32, the MultiSwiss 6x 32 Chucker delivers three key benefits:

- A new spindle allows the use of various clamping systems for push pliers, pull pliers or chucks. That means parts bigger than 32 mm can be gripped.
- A new, more compact machine body to conserve floor space and allow integration of through-spindle coolant.
- A robot solution integrated in the machine for loading/unloading parts via a small carousel that separates the machining area from the palletizing cell. This extremely modular solution is designed to accommodate the users' needs, depending on the parts to be machined or operations to be performed. Single or double gripper unloading by robot or standard unloading with the ramp are easily accommodated.

Featuring the same kinematics as the MultiSwiss 6x32—on the market since 2017—the MultiSwiss 6x32 Chucker features six spindles, up to three Y axes, and four tools for back operation. Part handling, cleaning and measuring can also be integrated into one elegant, compact, well-conceived solution.

Internal and external handling

An extraordinary range of handling options add even more value—and autonomy—for customers who turn to the MultiSwiss 6x32 Chucker as their chucker machining solution of choice:

Two different loading systems are available:

- Unloading can be done through the counter spindle as with a regular MultiSwiss machine.

- Unloading can also be done with a robot either out of the main spindle (no need for back operation) or from the counter operation if the user prefers palletization of the part. When the robot is used for unloading and palletization of the part, a swivel carousel is used and separates the working area and the palletizing cell, where a second robot loads and unload from the swivel carousel, making for a faster, cleaner solution. Depending on cycle time, a double gripper on the robot can be used to increase loading/unloading speed.

External handling is made possible by Tornos' own turnkey solution: a palletizing cell: a two-by-eight pallet system or a 16-pallet system (600 x 400 mm). For bulk parts, a simpler system can be used: The robot can be fed with a bowl feeder and train and a regular part extraction solution can be used.

Clamping solutions

For the main spindles and counter spindle, a collet system is used to clamp blanks up to 32 mm in diameter (about four times the ratio diameter/length to produce). Or chuck system can be used for bigger parts up to 50 mm in diameter and 50 mm long. Depending on the part's mechanical sensitivity, force adjustment is possible. The spindle has an internal, fixed stop. Compared to the competition, Tornos' solution doesn't need a mechanical adjustment as all spindles are controlled by independent axes that can be numerically offset through a parameter table. Furthermore, low- or high-pressure flushing is available during machining as well as during loading/unloading.

Unique all-in-one system

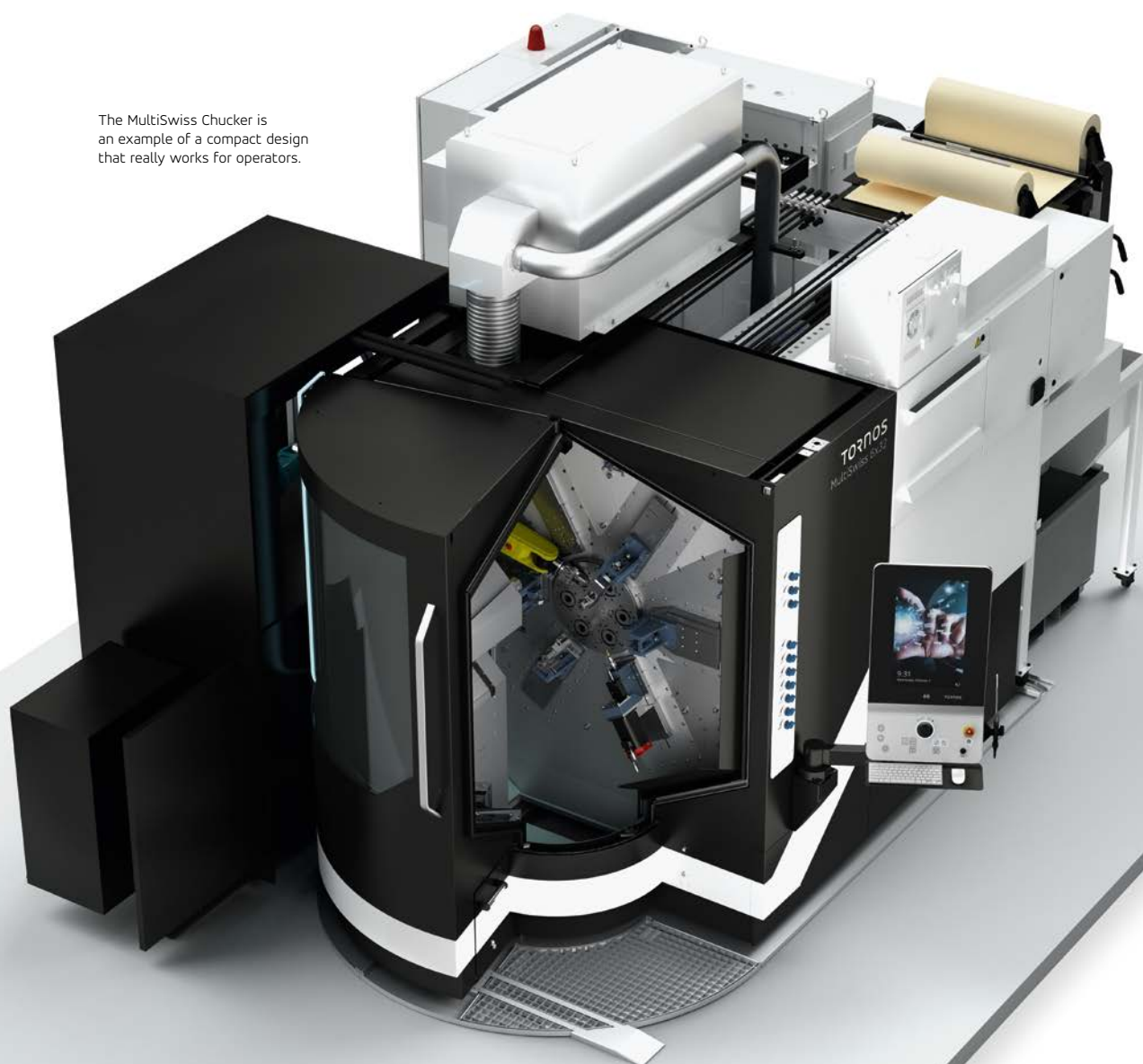
This solution's compactness—made possible in part because there's no need for a bar feeder—means users can benefit from a huge range of peripherals to achieve greater flexibility and autonomy. Standard included features are the system for managing swarf and an oil tank high-pressure pump, with dual filtration and a chiller. Customers who want to go back to a bar feeder solution can always mount a regular container with bar feeder later on.

Communicating with the machine

MultiSwiss 6x16 Chucker and MultiSwiss 6x32 Chucker users can experience true programming intelligence with Tornos' available TISIS communication software and the TB-Deco programming software. In today's competitive global marketplace, there's not a moment to waste in meeting customers' demands, and these two software solutions put users on the fast track to effortless programming and real-time process monitoring, compared to cam-operated transfer machines.

But that's not all: TB-Deco enables assessment of each machine's options, reduces the risk of collisions and consequent downtime, and improves production efficiency. This exceptional programming assistance system generates tables to control the paths of the axes and spindle, thanks to a powerful computer with integrated interpolator and machine simulator. Operations can be virtually positioned on a timeline and more efficient code for the computer numerical control (CNC) can be generated.

The MultiSwiss Chucker is an example of a compact design that really works for operators.



As a true portal to industry 4.0, TISIS takes the complexity out of process monitoring. Even from a remote location, users can keep an eye on details of the machining process from a smartphone or tablet. The software makes it easy—and fast—to transfer programs by USB key or directly onto the machine via the company's network. Parts' designs in various stages of completion can be stored with the program and easily found in the database by using the search function.

Tornos Service: close to the customer

Backed by both geographical proximity to customers and in-depth understanding of the processes, applications and market challenges, Tornos Service delivers an unparalleled continuum of support: start-up assistance, expert training and coaching, free hotline, on-site operations support and preventive maintenance, as well as original spare parts seamlessly delivered worldwide, complete overhaul service to extend the service life of Tornos machines, and a range of operations and X-change modules to expand customers' application capabilities and profitability.

Bringing customers' business goals to life

The Tornos Academy helps customers bring their business goals to life by matching their employees' skills with the expectations of their customers. Tornos Academy courses help customers optimize the productivity of their Tornos machines, increase their expertise, and seize new opportunities in growing industrial segments.

Tornos EMO Hanover 2019 (Hall 17, Stand D15) presence is the place to experience the game-changing potential of the new MultiSwiss Chucker, along with available options, services and software.

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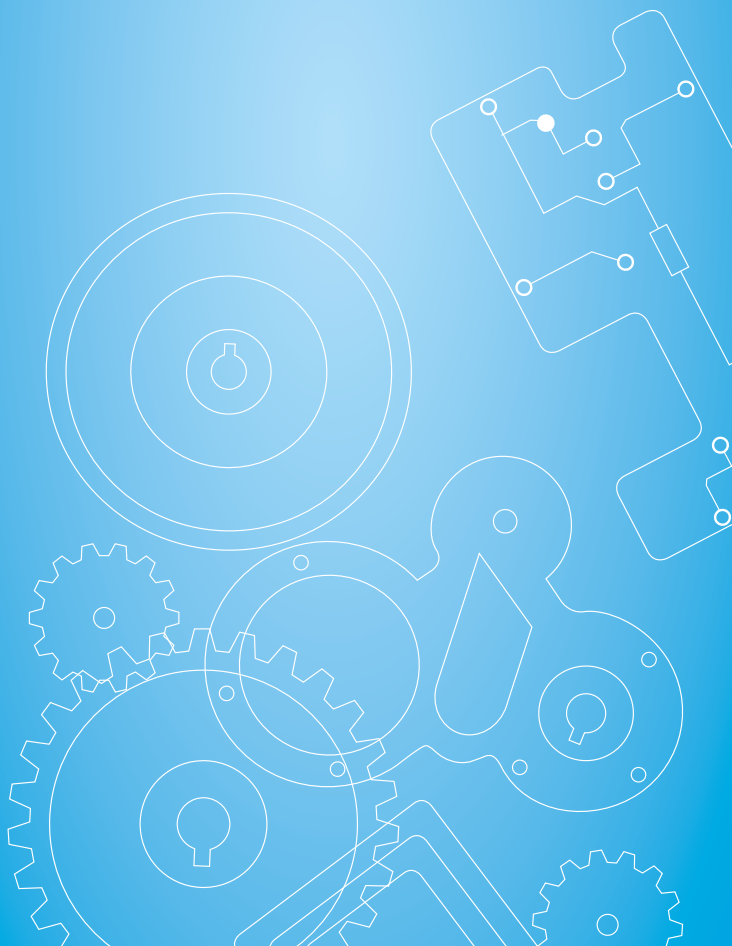
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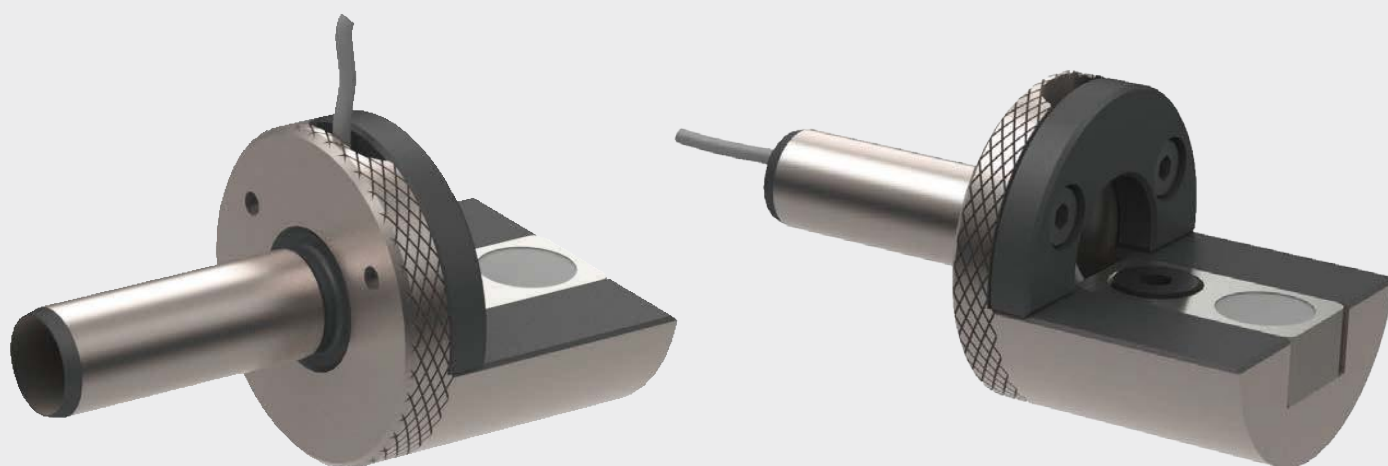
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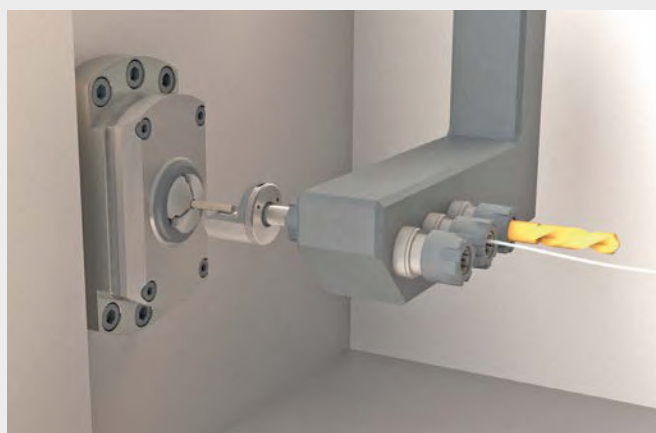
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Thanks to its adaptability, the SwissNano 7 is perfect for producing parts for a wide range of industries. For example, a thread whirler, a radial drill and a horn with two frontal tool holders can be added for the medical and dental sectors.

SWISSNANO 7:

more parts

per square metre

We have talked a lot in this magazine about the Tornos SwissNano 7 machine. This compact, agile little machine has already been a big success on the market. Economical, environmentally friendly and ultra-flexible, it can boost production per square metre in any workshop. The SwissNano 7 has the smallest footprint in its category on the market.

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More than 10 machines in less than 80 m²

It is possible to install 10 SwissNano 7 machines in a space of less than 80 m². In this configuration, the machine can be fitted with an LNS Tryton 3 m bar feeder; because this version is particularly long, the front of the bar feeder can be integrated in the SwissNano 7, eliminating length-related issues. The machine can also integrate a high-pressure unit, which is installed under the bar feeder. In concrete terms, this all translates to an ultra-compact machine that frees up workshop floor space. More machines mean more heat, in turn requiring more energy to cool the workshop. This problem had to be overcome by Tornos engineers, since the spindle and axis motors have been optimised to prevent excessive heating, with spindles producing no more

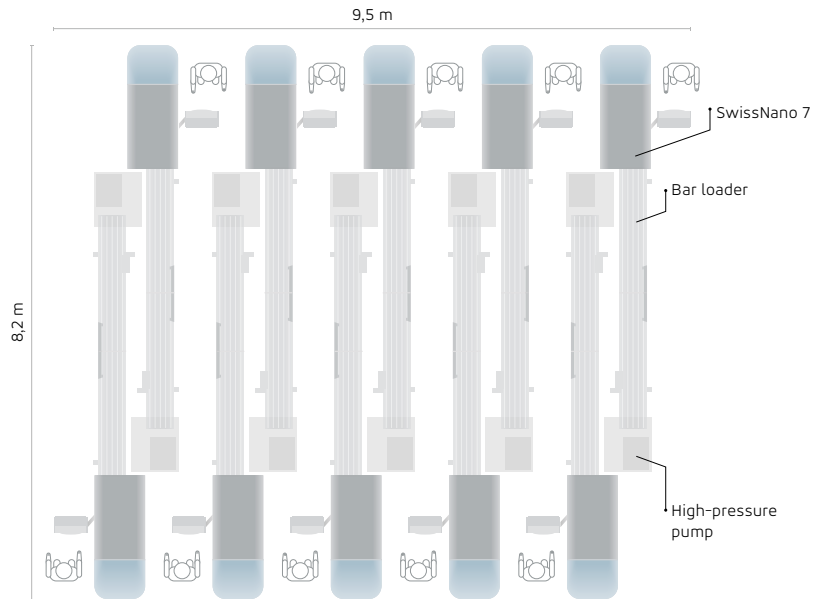
than 2.9 kW at peak output. However, the machine retains its high performance thanks to its 6-mm diameter drilling capacity with a feedrate of 0.2 mm per revolution.

A machine primed for optimisation

Just like the 4 model, the SwissNano 7 is designed to optimise production. Compact and economical, it offers impressive machining results. The SwissNano machine also has very short thermal loops, it is very stable, and the first part is therefore often good. Its highly rigid frame guarantees excellent finishes and reduces tool wear by between 30 and 50% under optimal conditions.

The machining area has 6 linear axes – 3 main operation axes and 3 secondary operation axes. This configuration is found on the SwissNano 4, but the tools are arranged differently:

- 1) For main operations, the first platten offers 3 positions for driven tools;
- 2) A frontal tool holder for 4 tools can be added under the counter spindle;



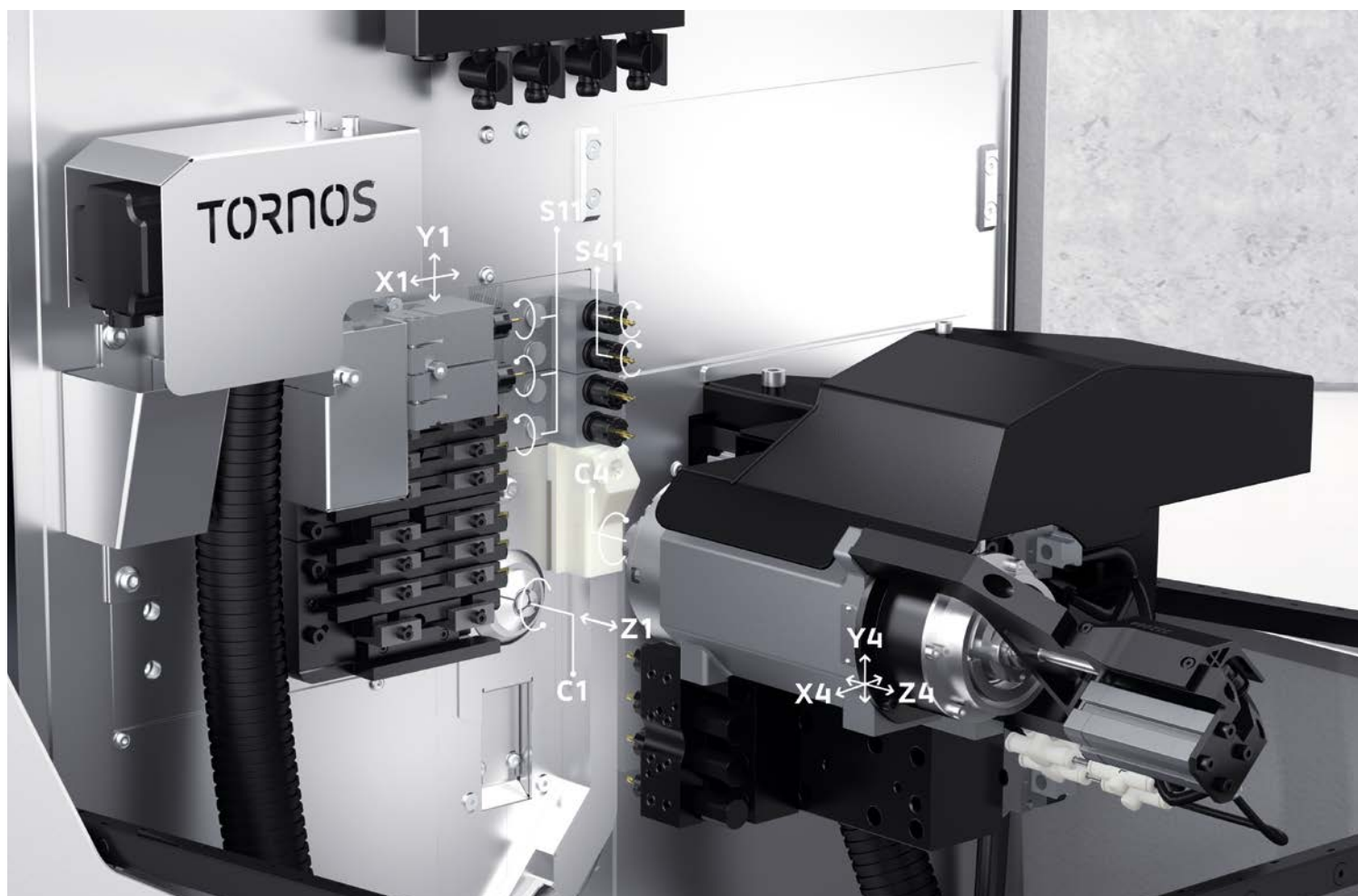
- 3) For secondary operations, the machine has 4 tool positions, 2 of which can be motorised. It is also possible to add high-frequency spindles for Torx-type micro-milling operations, for example.

The machine's strength lies in its modularity; it can be adapted to numerous types of market: For example, in the medical and dental sectors, a thread whirler and a radial drill, or a horn with two frontal tool holders, can be added.

But the SwissNano 7's flexibility is not restricted to the medical sectors; the machine is also equipped to service the electronics industry. A polygon tool can be installed for both main and secondary operations to boost the machine's capabilities.

The SwissNano 7 also expands the range of machineable watch parts compared to the SwissNano 4. A gear hobbing device can be added for both main and secondary operations. This enables high-added value parts, for example a sliding pinion, to be produced very easily.





The machining area on the SwissNano 7 is accessible from all sides – a real ergonomic advantage.

Ergonomics – at the heart of the concept

The machine offers outstanding accessibility thanks to the bubble, which enables perfect access to the machining area and positioning opposite the guide bush. "The operator can stand in front of the machine, and the counter spindle's 3 axes mean it can be centred very precisely," explains Philippe Charles, product manager at Tornos.

The machine's ergonomics are enhanced by the pivoting arm control and the excellent access to the swarf and parts trays.

As you can see, this is a very attractive machine available in a variety of colours.

Discover the machine at EMO

The SwissNano 7 is bigger, more powerful and more efficient than its little cousin, the SwissNano 4. Come and discover it on stand D15, hall 17, at EMO in Hanover, or at one of our subsidiaries around the world.

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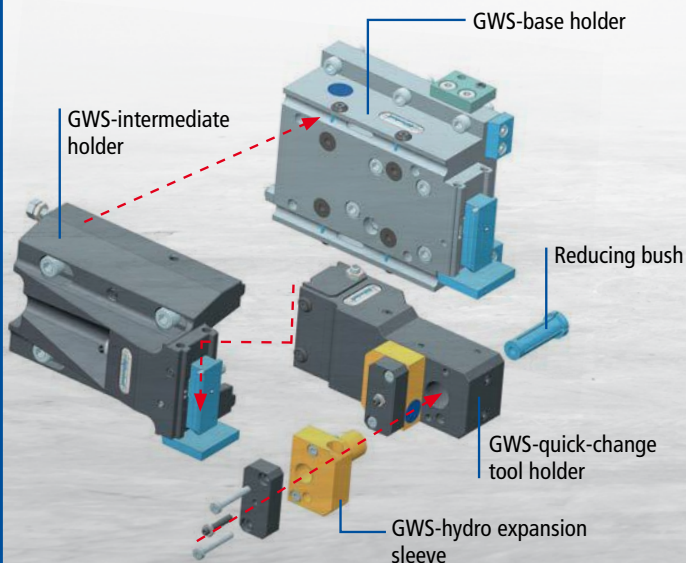
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Bar milling centres packed with potential

The CU 2007 and CU 3007 milling centres offer Tornos customers a complete solution for 3-7-axis machining. The same applies to BA 1008 machines, which represent a real alternative to extremely expensive bar machining centres. The CU 2007, CU 3007 and BA 1008 have upended the market by offering an infinitely customisable solution at a highly competitive price. Thanks to the expertise of Tornos engineers, these machining centres offer advanced customisation options to really boost potential. Robotisation, measuring and cleaning systems, closed loop... we can respond to every need!

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CU 2007: a custom-configurable machine

As with any traditional machining centre, the spindle and tool changer on the CU 2007 can be customised. The machine has 3 types of tool magazine that can accommodate:

1. 16 tools
2. 24 tools
3. 40 tools

Likewise, the spindle can be configured to suit the part requirements. There are 3 types of spindle available:

1. 12,000 rpm for high torque
2. 20,000 rpm for high torque and speed
3. 40,000 rpm for high speed

CU 2007

A custom-configurable machine

Thanks to its modular machining area, the CU 2007 can be used to create very complex parts.



1 Pick-up of the billet



2 Loading of the billet



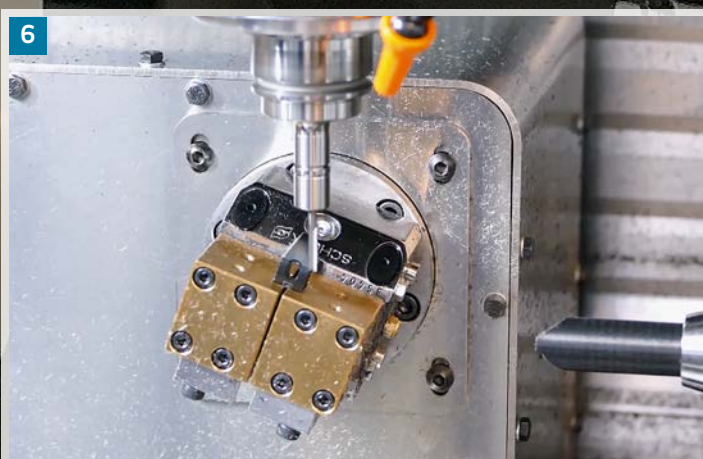
3 Machining of the front face



4 Simultaneous operation along 4 axes



5 Deburring of the part



6 Machining of the rear face

Versatile, precise, economical and infinitely customisable, the CU 2007 and CU 3007 machines offer a unique and efficient machining solution. But that's not all.

The CU 2007 can be converted into a bar machining centre!

In this configuration, it can be fitted with a 5-axis divider enabling it to produce highly complex parts. A second divider is installed on the machine, equipped with rotary axes and a linear axis that allow it to be converted into a bar feeding device as required. These two additional axes allow the machine to compete with more high-end turning/milling centres. "With the CU 2007, we can do 80-90% of what a bar machining centre – which can cost as much as 500,000 euros – can do. The CU 2007 doesn't cost anywhere near that much," reveals Arnaud Lienhard, Tornos Milling manager.

In fact, the second divider enables the machine to not only feed the spindle with the correct bar length, but also to finish the part, specifically its sixth face.



Once the front of the workpiece is positioned in the second divider, the cutting operation can start between the bar and the workpiece.

Once clamped, the rear of the workpiece can be machined with the machine's spindle.

This solution is ideal for producing PEEK intervertebral cages, for example, or maxillofacial plates. The CU 2007 can produce highly complex parts.

BA 1008 XT: the bar-turner for prismatic parts

The BA 1008 range is synonymous with high precision and high reliability: this little bar milling machine is a favourite among highly demanding users. Its HP version with 120 bar through-spindle cooling has surprised even tool manufacturers with its performance on the hardest materials. The XT extended version pushes the limits of possibility even further.

It can house up to 8 spindles and two tool changers for a maximum capacity of 23 tools. Thanks to the compact design of these tool changers, it is possible to install a B axis on the machine. They have also been optimised to eliminate corners and ensure a perfect flow of swarf in the machining area. For machines equipped with a casing for precious metals, swarf recovery is still just as effective. The tool changer on the front spindle has 10 positions and the lateral spindle changer has six.

The BA 1008 can accommodate bars with a diameter of 16 mm. The configuration of the BA 1008 XT significantly increases the machining options, enabling the manufacture of parts previously impossible to produce.

The entire system remains highly flexible and easy to configure depending on the part requirements. In order to improve the machine's autonomy, it can be equipped with a bar feeder or operate with coils. The BA 1008 and CU 2007 are highly affordable, efficient solutions. Do not hesitate to contact us for more information.

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The Chicago Customer Center is decorated in a classic, understated style in line with the new Tornos image.



Daniel Märklin, appointed as CEO of Tornos US in February 2019, is delighted to welcome customers and suppliers to this new convivial space.

60th anniversary

of Tornos Technologies US and inauguration of the Chicago Customer Center

The new Tornos Customer Center in Chicago was officially opened in Des Plaines in May. The opening ceremony was attended by numerous figures from the machine-tool world. The new centre will enable Tornos to offer even better customer service. It is a key part of the group's strategy in the USA, as it celebrates 60 years on the American market.

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Organised around the company's perennial "Turning Together" theme, the opening ceremony for the Chicago Customer Center took place on 30th April, for what looks set to be a very promising venture. It confirms Tornos's long-standing presence in the USA, demonstrating its commitment and desire to offer the very best to its American customers. The event also commemorated the 60th anniversary of the Swiss company's establishment in the States in 1959.

During the open days following the Grand Opening, customers and stakeholders were invited to visit the new customer centre and to celebrate 60 years of success in the USA. Over the course of these two days, cutting-edge seminars were held on the medical,

Development of the USA market

As globalisation accelerates, operating on an international level has become common practice. However, back in the 1970s, the decision of several Swiss pioneers to leave their homeland to go and work abroad was a significant development. It was an adventure in itself.

A small number of Swiss companies offered their staff plane tickets to go and work and learn a foreign language in the country of origin. Tornos was one of them. The American subsidiary was therefore set up by expats from the Moutier region exporting a brand that had made its first foray into the USA in the 1950s.

“Swiss type” machines, as turning machines are known in the USA, are renowned for their quality, partly thanks to Tornos’s efforts over many decades.

Of those who embarked on the one-way trip to the States, most returned, starting their own businesses in the Jura Arc region. There were also those who, seduced by the freedom and open spaces, chose to settle long-term in the USA. Two of them still work for Tornos, having remained loyal to their brand and company.

When asked how they view the situation across the pond, they express concern that money has become king, and that the pioneering spirit has crumbled in the face of a reluctance to commit unless there is zero financial risk.

There is no doubt that the market has changed a lot. And, unlike the Europeans, the Americans have an “everything, now” approach. The market is very free, very independent but quick to evolve, and characterised by an impatience and a desire to possess and to live the dream, as cheaply as possible.

What is most lacking in the USA? Like everywhere else in the world, there is a drastic shortage of qualified labour. Customers are prepared to invest in equipment but, above all, they need guidance on how to use it and, specifically, how to get the best out of it to make a quick profit.

In this respect, Tornos has an important role to play. Primarily through the courses run by the Tornos Academy, which offer training to customers and staff on markets they may be unfamiliar with, and on how to discover new opportunities. Because, as Tornos’s most experienced employees will tell you, it is technical expertise and practical knowledge that really count, and which we must value above all.

America therefore needs highly qualified staff with versatility and the ability to effectively leverage their experience.





automotive and electronics sectors. Alongside this event, Tornos US also previewed its new SwissNano 7 mm for American customers.

The unique kinematics of the new SwissNano enable turning, drilling, hobbing, deburring, roughing and finishing operations. The SwissNano can machine a huge range of precision parts, including for the micromechanical, electronics, medical and dental sectors.

A large-scale showroom

This vast customer centre covers almost 1200 m². It includes a spacious, state-of-the-art showroom to exhibit each product in the Tornos range, a large warehouse for storing spare parts and an expanded office space.

Daniel Märklin, appointed head of Tornos US in February 2019, was delighted to welcome customers and suppliers to this convivial space. In addition to his strongly customer-focused approach, he is aiming to further strengthen Tornos's reputation in the USA by offering customised services delivered by expert staff.

His strategy also consists in reinforcing Tornos's flexibility through innovation and by enhancing its operational excellence. Tornos's approach involves offering unique solutions for target market segments. It already has a proven track record in the States, and the new centre will enable the offering to be further extended going forward. It represents a clear commitment from Tornos towards this market and its customers.

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On the podium from left to right: Prof. Dr.-Ing. Siegfried Schmalzried, production technology, Furtwangen University, Michael Hauser, CEO of Tornos and Dr. Rolf Bulander, former board member at Robert Bosch GmbH.



Attendees discovered the latest developments focused on the future of mobility and the associated industrial challenges in this extraordinary setting.

New perspectives *on mobility*

The Intelligent Manufacturing Conference (IMC) 2019 at Rottweil's Kraftwerk kept all its promises. An impressive panel of experts spoke about what mobility might be in the future, and how the industry can cope with the challenges ahead. Organized by Swiss machine tool manufacturer Tornos, the event was a great success, and the many participants appreciated both the experts' presentations and the fruitful related exchanges.

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The 150 people present at the IMC 2019 did not regret having taken a ticket for the mobility of tomorrow. Thanks to the experts' present, they were able, in four well-conducted presentations, to benefit from several years of mobility-related research concentrated in the one-day event. Following the presentations, a panel discussion - guided by journalist and digital economist Katrin-Cécile Ziegler - provided constructive insights into the various points of view and culminated a rich and well-rounded morning.

How will we move in the future? Are current means of transport obsolete? Should we give up some fuels, such as diesel, which some consider toxic?



Prof. Dr. Sc. Techn. Thomas Koch, director of the Karlsruhe Institute of Technology, during his presentation "Emissions, nuisance and their future impact – A factual evaluation of diesel technology".



Does new mobility need new suppliers?

Opening the conference with the latest mobility trends was Dr. Rolf Bulander, an ex-member of the board of management of Robert Bosch GmbH, where he was responsible for the division Mobility Solutions. There is not just one mobility trend of the future, but several, and they are influenced by the consumer. This was among the important topics discussed at the IMC 2019.

Use existing competences in electric mobility

M. Sc. Janna Hofmann was the second expert to address the topic of Mobility of the Future at the IMC 2019. She works at the Karlsruhe Institute of Technology, where she supports companies with the Fit4E project in the development of methods and approaches. She emphasized the challenges of change and how teams can use existing competences to manage the new requirements together within their companies.

Take advantage of the pressure of the market

The third presentation of the day by Prof. Dr.-Ing. Siegfried Schmalzried met with great interest from the participants in Tornos' IMC 2019 on Thursday morning.

Through his smart approach, the participants learned that the internal combustion engine is far from history. Due to growth in markets outside the European Union and the United States, the peak is expected by 2030. Increasing performance and cost-effectiveness through adapted production processes must increase, Siegfried Schmalzried says, and being more efficient is the goal!

A factual assessment of diesel technology

Prof. Dr. sc. techn. Thomas Koch was the fourth speaker on the podium. His approach, based on the past, has shown that diesel is not as devilish as some people think. Thomas Koch is Head of the Institute for Piston Machines at the Karlsruhe Institute of Technology. In his view, one can solve the exhaust problem technically. Air improvement is an important topic in Germany. The internal combustion engine is better than its reputation. And electric mobility? It is currently not the best solution for him, because it is just too expensive, he says.

Engaging Roundtables sessions

The afternoon segment of the IMC 2019 was largely devoted to Roundtable sessions bringing together the event partners. Among them were Grassinger, Göldenbott, Schmolz + Bickenbach, Schlenker, Walter and Tornos.



The Intelligent Manufacturing Conference (IMC) 2019 held at the Rottweil Power Station fully lived up to expectations... and what an incredible venue!

Each of these partners presented specific products and solutions during the day of mobility, giving participants the opportunity to ask questions and discuss production topics during these sessions and at the dedicated exhibition area.

A unique experience

As another IMC 2019 highlight, Tornos CEO Michael Hauser emphasized the German market's importance to the machine tool industry. Case in point: Tornos recently acquired land in Pforzheim and will soon begin construction of its new Customer Center. This is a clear sign of the Tornos' desire to assert its presence on this territory.

A spectacular day in every way

The day ended as it began, with rappers Toba & Pheel who, with rhythm and humor, reviewed the different key stages of the IMC 2019. Their performance was praised for its finesse, wit and skill.

Every participant, presenter and partner made the IMC 2019 event to remember, including Tornos' IMC 2019 partner mav (Innovation in der spannenden Fertigung), a German industry asset, and the Kraftwerk, which offers a breathtaking setting for such events.

Each participant left the IMC 2019 with a different, richer, more varied expertise in the mobility of tomorrow. The day also provided, in addition to the workshops and exhibitions presented, important networking opportunities between industry and interested parties.

Tornos is delighted to have given everyone present a glimpse of what tomorrow will bring in terms of mobility. More than a risk, the changes ahead are an opportunity for the machine tool industry to stand out and innovate. As a pioneer of turning technology and a source of strength to automotive industry original equipment manufacturers (OEMS) and suppliers, Tornos will have an important role to play.

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GRIMSMO KNIVES:

Going 'Full Grimsmo'

with master knife maker John Grimsmo

Grimsmo Knives owner John Grimsmo isn't sure certain when, where or how his company's legions of fans began using the term "Full Grimsmo," but he knows what exactly what it means. That's because he and his six-strong team in Stoney Creek, Ontario, Canada, are living the "Full Grimsmo" philosophy—"Strive for perfection, settle for excellence"—every day, and with the help of a brand new Tornos Swiss GT 13 Swiss-type lathe.



instagram.com/
explore/tags/
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youtube.com/
user/JohnGrimsmo



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grismoknives.com

John Grimsmo, who just turned 36, considers himself a "CNC machinist nerd, father, husband..." and the knives he makes—as each one attests—are "Proudly Made In Canada." At his core, he personifies "maker culture," a contemporary subculture where technology-driven do-it-yourself culture joins hacker culture. Maker culture encompasses a vast range of passions, from electronics and 3D printing to computer numerical control tools, and generally encourages learning and sharing skills and experiences. It's a culture that couldn't find a better—or more enthusiastic—ambassador than Grimsmo.

"My father is a computer nerd and entrepreneur and I grew up around the self-employed scene, moving all over the place. I stopped counting after 15 houses," Grimsmo recalled. "I started working with my dad, making websites and then I started my own web design company and that led me into designing

websites for people who modified cars and then into that world and the companies that do that work, and learning how cars are made.”

Before long, Grimsmo’s quest to make his own Volvo 240 “go faster and handle better” led to him fabricating his own car parts, a task that required him to learn to weld and execute simple lathe work on a 1940s-era lathe. By then, he had phased out of web design and was pushing full steam ahead making car parts: He opened his own shop, taught himself to use computer numerical control (CNC) machinery and computer-aided design (CAD) and computer-aided manufacturing (CAM) software.

“I actually built my first two CNC machines from manual machines,” he said, chuckling at that real-life demonstration of the adage, “necessity is the mother of invention.”

It was an offhand comment from a friend that touched off Grimsmo’s career change from car component fabricator to knife maker.

“I had taught myself the really time-consuming process of anodizing aluminum and was offering this service. A local guy asked if he could bring in an aluminum knife for me to anodize to toxic green. He actually brought 10 knives with him. I fell in love,” Grimsmo said of the moment he realized that a vast and “ridiculously awesome” subculture has developed around custom knives. “This guy told me, ‘People are selling knives like this for \$500 to \$1,000 each.’ I didn’t sleep for days while I researched custom knives.”

Knives were nothing new to Grimsmo: He still has the Grohmann D.H. Russell Canadian belt knife that his godfather gave him for his 11th birthday, and he got more than a little familiar with knives along his Boy Scouts path to becoming an Eagle Scout at 18. And it didn’t hurt that Grimsmo was also a big fan of the 1980s television series, “MacGyver,” about a genius, multilingual, problem-solving secret agent who carried a Swiss Army knife and could fashion almost any combination of ordinary objects into a means of thwarting an attack. Backed by lots of enthusiasm and plenty of research—but very little money—Grimsmo traveled to the Las Vegas Knife Show to do more research.

“It was amazing! It really opened my eyes to what this industry offers, what I can do for it and what it can do for me,” he said, crediting his wife and business

partner, Meg, with “allowing me to find my ‘thing’ and supporting me through the process.”

Grimsmo Knives—which today makes, by hand, two exquisite ranges of luxury knives, the Norseman and the Rask, as well the artfully engineered Saga pen—was born in a garage with only two employees: Grimsmo and his wife. But he was soon joined by his brother, Erik, and five years later, Meg Grimsmo’s father joined that company as its accountant. Today, the company employs a staff of seven—plus one dog—and makes about six knives per day with a level of perfection that can only be described as “Full Grimsmo.”

It was that pursuit of perfection that led Grimsmo to Tornos.

“The first time I went to a machine tool show, I felt like I didn’t belong. But the more I went, the more I learned, and my confidence grew,” he explained. Eventually he connected with Tornos’ Canadian distributor, Elliott-Matsuura Canada, began attending their annual open houses, and bought his first professional lathe there. When Grimsmo was ready to buy a Swiss-type lathe, that relationship made a big difference.

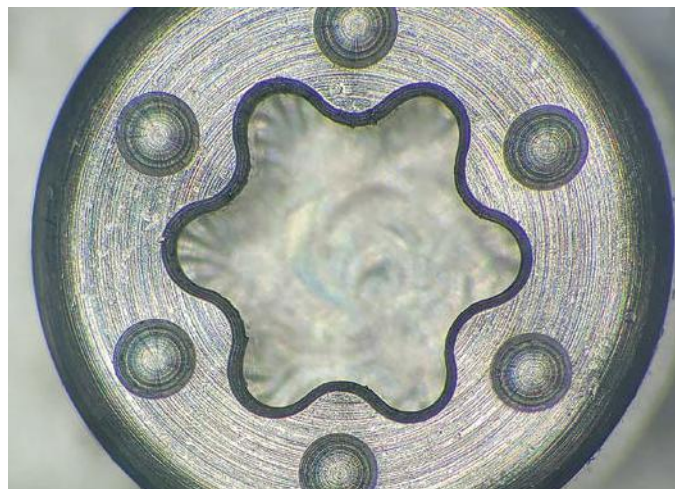
“I’m a relationship guy,” he said in explanation. But it wasn’t just the relationship that influenced Grimsmo’s decision to invest in a new Tornos Swiss GT 13.

“The specs really suited me. You can get so many tools in that machine, and I was looking for a solution that I could use to make every one of our products with as close to one setup as possible,” he said.

In fact, Grimsmo’s Swiss GT 13 will make virtually every Grimsmo Knife component—pivots, pivot screws, bearings, screws, spacers, etc.—except the blades and handles.

“I love this machine’s modularity and how its tooling box comes off to allow me to configure the layout as I see fit,” he said. “I have actually already made more than 1,000 parts on the Swiss GT 13 since we took delivery in June, and I’m extraordinarily happy with the results.”

The Swiss GT 13 is just the solution to accommodate that Grimsmo’s “Strive for perfection, settle for excellence” ethic. In addition to holding the required tolerances, the machine can take up to 30 tools, including 12 rotating tools. The Y axis



Grimso's Swiss GT 13 will make virtually every Grimsmo Knife component—pivots, pivot screws, bearings, screws, spacers, etc.—except the blades and handles.



offers exemplary machining capability in secondary operation, allowing some complex workpieces to be produced without reworking.

"This machine is small, light and nimble, and moves quickly, and it delivers the tightest tolerances," he said. And by "tightest tolerances," he again goes "full Grimsmo."

"I'm always shooting for 1/10,000th of an inch on every part," he said. In addition to the Swiss GT 13, Grimsmo has also purchased a German five-axis milling machine and is working on a "top secret" concept that he believes will shake up the milling end of the machine tool industry—and he's looking to at least quadruple his shop space.

"I'm so proud of the team we've built and the impact we're having on not just the knife-making industry but manufacturing as a whole," he said. "We don't just make knives—we make connections."

To get the "Full Grimsmo" experience, visit <https://grimsmoknives.com>, and check out John Grimsmo's Youtube channel and Instagram presence.

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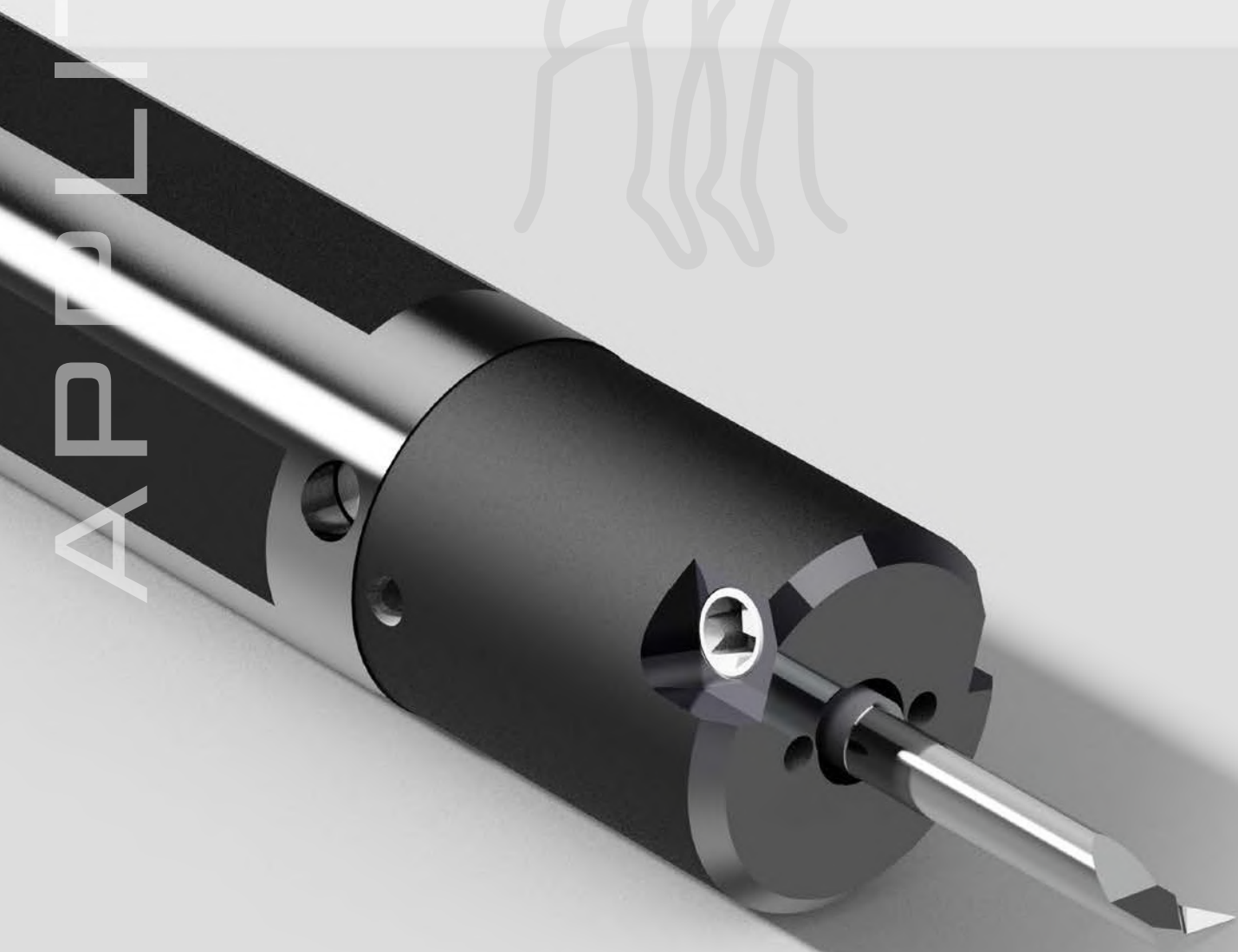
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A Tornos SwissNano 7 machine is shown in a gym setting. The machine is white and black, with a control panel on the left side. It is surrounded by a misty atmosphere. In the background, a punching bag hangs from the ceiling. The machine is positioned in the center of the frame, with its front facing slightly to the right. The overall scene is lit with a warm, orange glow, creating a dramatic and industrial feel.

*Someone has been
working out*

SwissNano 7